

Book For  
Railway Recruitment Board



Ratio and Proportion



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Q. 1 A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 1000 more than D, what is B's share?

- [A] Rs. 500
- [B] Rs. 1500
- [C] Rs. 2000
- [D] None of these

Answer Option [C]

**Explanation:**

Let the shares of A, B, C and D be Rs.  $5x$ , Rs.  $2x$ , Rs.  $4x$  and Rs.  $3x$  respectively.

Then,  $4x - 3x = 1000$

$\Rightarrow x = 1000$ .

$\therefore$  B's share = Rs.  $2x$  = Rs.  $(2 \times 1000)$  = Rs. 2000.

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Q. 2 If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number?

- [A] 2 : 5
- [B] 3 : 7
- [C] 5 : 3
- [D] 7 : 3

Answer Option [C]

**Explanation:**

Let 40% of A =  $\frac{2}{3}$  B

Then,  $\frac{40A}{100} = \frac{2B}{3}$

$\Rightarrow \frac{2A}{5} = \frac{2B}{3}$

$\Rightarrow \frac{A}{B} = \left( \frac{2}{3} \times \frac{5}{2} \right) = \frac{5}{3}$

$\therefore$  A : B = 5 : 3.

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Q. 3 The ratio of the number of boys and girls in a college is 7 : 8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?

- [A] 8 : 9
- [B] 17 : 18
- [C] 21 : 22
- [D] Cannot be determined

Answer Option [C]

**Explanation:**

Originally, let the number of boys and girls in the college be  $7x$  and  $8x$  respectively.

Their increased number is (120% of  $7x$ ) and (110% of  $8x$ ).

$\Rightarrow \left( \frac{120}{100} \times 7x \right)$  and  $\left( \frac{110}{100} \times 8x \right)$

$\Rightarrow \frac{42x}{5}$  and  $\frac{44x}{5}$

$$\therefore \text{The required ratio} = \left( \frac{42x}{5} : \frac{44x}{5} \right) = 21 : 22.$$

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Q. 4 In a mixture 60 litres, the ratio of milk and water 2 : 1. If the this ratio is to be 1 : 2, then the quantity of water to be further added is:

- [A] 20 litres
- [B] 30 litres
- [C] 40 litres
- [D] 60 litres

Answer Option [D]

**Explanation:**

$$\text{Quantity of milk} = \left( 60 \times \frac{2}{3} \right) \text{ litres} = 40 \text{ litres.}$$

Quantity of water in it = (60 - 40) litres = 20 litres.

New ratio = 1 : 2

Let quantity of water to be added further be  $x$  litres.

$$\text{Then, milk : water} = \left( \frac{40}{20 + x} \right).$$

$$\text{Now, } \left( \frac{40}{20 + x} \right) = \frac{1}{2}$$

$$\Rightarrow 20 + x = 80$$

$$\Rightarrow x = 60.$$

$\therefore$  Quantity of water to be added = 60 litres.

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Q. 5 A and B together have Rs. 1210. If  $\frac{4}{15}$  of A's amount is equal to  $\frac{2}{5}$  of B's amount, how much amount does B have?

- [A] Rs. 460
- [B] Rs. 484
- [C] Rs. 550
- [D] Rs. 664

Answer Option [B]

**Explanation:**

$$\frac{4}{15} A = \frac{2}{5} B$$

$$\Rightarrow A = \left( \frac{2}{5} \times \frac{15}{4} \right) B$$

$$\Rightarrow A = \frac{3}{2} B$$

$$\Rightarrow \frac{A}{B} = \frac{3}{2}$$

$$\Rightarrow A : B = 3 : 2.$$

$$\therefore \text{B's share} = \text{Rs. } \left( 1210 \times \frac{2}{5} \right) = \text{Rs. 484.}$$

Q. 6 Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's salary?

- [A] Rs. 17,000
- [B] Rs. 20,000
- [C] Rs. 25,500
- [D] Rs. 38,000

Answer Option [D]

**Explanation:**

Let the original salaries of Ravi and Sumit be Rs.  $2x$  and Rs.  $3x$  respectively.

$$\text{Then, } \frac{2x + 4000}{3x + 4000} = \frac{40}{57}$$

$$\Rightarrow 57(2x + 4000) = 40(3x + 4000)$$

$$\Rightarrow 6x = 68,000$$

$$\Rightarrow 3x = 34,000$$

$$\text{Sumit's present salary} = (3x + 4000) = \text{Rs.}(34000 + 4000) = \text{Rs. } 38,000.$$

Q. 7 If 0.75 : x :: 5 : 8, then x is equal to:

- [A] 1.12
- [B] 1.2
- [C] 1.25
- [D] 1.30

Answer Option [B]

**Explanation:**

$$(x \times 5) = (0.75 \times 8) \Rightarrow x = \left(\frac{6}{5}\right) = 1.20$$

Q. 8 The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be new ratio of their salaries?

- [A] 3 : 3 : 10
- [B] 10 : 11 : 20
- [C] 23 : 33 : 60
- [D] Cannot be determined

Answer Option [C]

**Explanation:**

Let A =  $2k$ , B =  $3k$  and C =  $5k$ .

$$\text{A's new salary} = \frac{115}{100} \text{ of } 2k = \left(\frac{115}{100} \times 2k\right) = \frac{23k}{10}$$

$$\text{B's new salary} = \frac{110}{100} \text{ of } 3k = \left(\frac{110}{100} \times 3k\right) = \frac{33k}{10}$$

$$C's \text{ new salary} = \frac{120}{100} \text{ of } 5k = \left( \frac{120}{100} \times 5k \right) = 6k$$

$$\therefore \text{New ratio} \left( \frac{23k}{10} : \frac{33k}{10} : 6k \right) = 23 : 33 : 60$$

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Q. 9 If Rs. 782 be divided into three parts, proportional to  $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$ , then the first part is:

- [A] Rs. 182
- [B] Rs. 190
- [C] Rs. 196
- [D] Rs. 204

Answer Option [D]

**Explanation:**

$$\text{Given ratio} = \frac{1}{2} : \frac{2}{3} : \frac{3}{4} = 6 : 8 : 9.$$

$$\therefore 1^{\text{st}} \text{ part} = \text{Rs.} \left( 782 \times \frac{6}{23} \right) = \text{Rs. } 204$$

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Q. 10 The sum of three numbers is 98. If the ratio of the first to second is 2 : 3 and that of the second to the third is 5 : 8, then the second number is:

- [A] 20
- [B] 30
- [C] 48
- [D] 58

Answer Option [B]

**Explanation:**

Let the three parts be A, B, C. Then,

$$A : B = 2 : 3 \text{ and } B : C = 5 : 8 = \left( 5 \times \frac{3}{5} \right) : \left( 8 \times \frac{3}{5} \right) = 3 : \frac{24}{5}$$

$$\Rightarrow A : B : C = 2 : 3 : \frac{24}{5} = 10 : 15 : 24$$

$$\Rightarrow B = \left( 98 \times \frac{15}{49} \right) = 30.$$

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Q. 11 Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

- [A] 2 : 3 : 4
- [B] 6 : 7 : 8
- [C] 6 : 8 : 9

[D] None of these

Answer Option [A]

**Explanation:**

Originally, let the number of seats for Mathematics, Physics and Biology be  $5x$ ,  $7x$  and  $8x$  respectively. Number of increased seats are (140% of  $5x$ ), (150% of  $7x$ ) and (175% of  $8x$ ).

$$\Rightarrow \left( \frac{140}{100} \times 5x \right), \left( \frac{150}{100} \times 7x \right) \text{ and } \left( \frac{175}{100} \times 8x \right)$$

$$\Rightarrow 7x, \frac{21x}{2} \text{ and } 14x.$$

$$\therefore \text{The required ratio} = 7x : \frac{21x}{2} : 14x$$

$$\Rightarrow 14x : 21x : 28x$$

$$\Rightarrow 2 : 3 : 4.$$

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Q. 12 In a bag, there are coins of 25 p, 10 p and 5 p in the ratio of 1 : 2 : 3. If there is Rs. 30 in all, how many 5 p coins are there?

[A] 50

[B] 100

[C] 150

[D] 200

Answer Option [C]

**Explanation:**

Let the number of 25 p, 10 p and 5 p coins be  $x$ ,  $2x$ ,  $3x$  respectively.

$$\text{Then, sum of their values} = \text{Rs.} \left( \frac{25x}{100} + \frac{10 \times 2x}{100} + \frac{5 \times 3x}{100} \right) = \text{Rs.} \frac{60x}{100}$$

$$\therefore \frac{60x}{100} = 30 \Leftrightarrow x = \frac{30 \times 100}{60} = 50.$$

Hence, the number of 5 p coins =  $(3 \times 50) = 150$ .

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Q. 13 Two number are in the ratio 3 : 5. If 9 is subtracted from each, the new numbers are in the ratio 12 : 23. The smaller number is:

[A] 27

[B] 33

[C] 49

[D] 55

Answer Option [B]

**Explanation:**

Let the numbers be  $3x$  and  $5x$ .

$$\text{Then, } \frac{3x - 9}{5x - 9} = \frac{12}{23}$$

$$\Rightarrow 23(3x - 9) = 12(5x - 9)$$

$$\Rightarrow 9x = 99$$

$$\Rightarrow x = 11.$$

$\therefore$  The smaller number =  $(3 \times 11) = 33$ .

Q. 14 Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is:

- [A] 2 : 5
- [B] 3 : 5
- [C] 4 : 5
- [D] 6 : 7

Answer Option [C]

**Explanation:**

Let the third number be  $x$ .

$$\text{Then, first number} = 120\% \text{ of } x = \frac{120x}{100} = \frac{6x}{5}$$

$$\text{Second number} = 150\% \text{ of } x = \frac{150x}{100} = \frac{3x}{2}$$

$$\therefore \text{Ratio of first two numbers} = \left( \frac{6x}{5} : \frac{3x}{2} \right) = 12x : 15x = 4 : 5.$$

Q. 15 The fourth proportional to 5, 8, 15 is:

- [A] 18
- [B] 24
- [C] 19
- [D] 20

Answer Option [B]

**Explanation:**

Let the fourth proportional to 5, 8, 15 be  $x$ .

Then,  $5 : 8 : 15 : x$

$$\Rightarrow 5x = (8 \times 15)$$

$$x = \frac{(8 \times 15)}{5} = 24.$$